Acids, Bases, and Solutions ▪ *Chapter Test*

Acids, Bases, and Solutions

Multiple Choice

Write the letter of the correct answer on the line at the left.

_____ 1. A mixture in which particles can be seen and easily separated by settling or filtration is a

   a. suspension.   **b.** solution.
   c. solute.   **d.** solvent.

_____ 2. A neutral solution has a pH of

   a. 3.   **b.** 7.
   c. 5.   **d.** 9.

_____ 3. A base

   a. tastes sour.
   b. corrodes metals.
   c. does not react with carbonates.
   d. turns litmus red.

_____ 4. Solutes lower the freezing point of water by

   a. stopping water molecules from moving.
   b. forming crystals.
   c. making it harder for water to form crystals.
   d. making the water molecules move faster.

_____ 5. A polar solvent will most likely dissolve

   a. any solute.   **b.** polar solutes.
   c. nonpolar solutes.   **d.** no solute.

_____ 6. Sodium hydroxide, potassium hydroxide, and magnesium hydroxide all produce hydroxide ions in water and are therefore

   a. salts.   **b.** acids.
   c. bases.   **d.** low in pH.

_____ 7. If you add a small amount of hydrochloric acid to 4 liters of water, what type of solution would you expect to have?

   a. concentrated solution   **b.** basic solution
   c. dilute solution   **d.** saturated solution

_____ 8. The pH scale

   a. is numbered from 1 to 12.
   b. measures the concentration of bases.
   c. measures the concentration of acids.
   d. measures the concentration of hydrogen ions.

_____ **9.** Neutralization

      a. is a reaction between an acid and a base.

      b. occurs when acid is dissolved in water.

      c. forms an acid and a base.

      d. does not change the pH of a solution.

_____ **10.** The pH in the digestive system is highest in the

      a. mouth.   **b.** stomach.

      c. small intestine.   **d.** large intestine.

Completion

Fill in the line to complete each statement.

11. If you add solute to a dilute solution, the solution becomes a more _____ solution.

12. Acids are described as being _____, because they dissolve some metals.

13. A(n) _____ is a substance that turns different colors in an acid or a base.

14. A(n) _____ is a mixture containing small, undissolved particles that do not settle out.

15. The process of chemical _____ breaks down the complex molecules of food into smaller molecules.

True or False

If the statement is true, write true. *If it is false, change the underlined word or words to make the statement true.*

_____ **16.** When a base reacts with an acid, water and a(n) <u>salt</u> forms.

_____ **17.** When acids react with carbonate compounds, <u>carbon dioxide</u> forms.

_____ **18.** A(n) <u>base</u> forms hydrogen ions when it dissolves in water.

_____ **19.** The <u>solute</u> is the part of a solution present in the largest amount.

_____ **20.** Solutes <u>decrease</u> the boiling point of a solvent.

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Using Science Skills: Interpreting Diagrams

Use the diagram below to answer the following questions.

Solution of table sugar in water

Crystals of table sugar
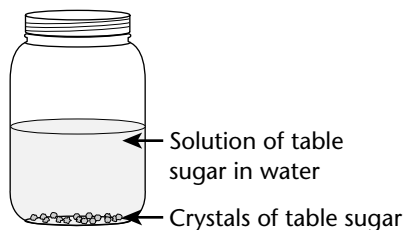
21. The jar in the diagram has been shaken and allowed to sit for a day. What can you infer about the concentration of the solution? Explain.

_____

_____

_____

_____

22. Describe the changes that would take place to the materials in the jar if the jar were to be cooled. What would happen if the jar were heated instead?

_____

_____

_____

_____

_____

_____

_____

_____

Essay

Write an answer for each of the following on a separate sheet of paper.

23. What happens to the particles of a solid solute when the solute is dissolved in a solvent?

24. Why must the pH values of the mouth, stomach, and small intestine be different?

25. In what two ways is adding antifreeze to the water in a car radiator useful?

Name _____ Date _____ Class _____

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Using Science Skills

Use the equation below to answer the following questions in the spaces provided.

$$NH_3 + H_2O \longrightarrow NH_4^+ + OH^-$$
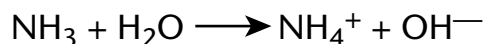
26. Interpreting Diagrams Is ammonia (NH_3) an acid or a base? How do you know?

_____

_____

27. Applying Concepts If you did not know the products of the resulting solution, how could you determine whether it contains ions or a dissolved molecular solid?

_____

_____

_____

Essay

Write an answer for each of the following in the spaces provided.

28. The water in some lakes is basic because the rock underneath the lake is limestone rock made up of calcium carbonate. What chemical reaction happens when acid rain falls on a lake such as this? What happens to the lake's pH?

_____

_____

_____

_____

29. How is a weak acid different from a dilute acid?

_____

_____

_____

_____

30. How are the dissolved particles of a molecular solid, such as sugar, different from the dissolved particles of an ionic solid, such as table salt?

_____

_____

_____

_____

_____

_____